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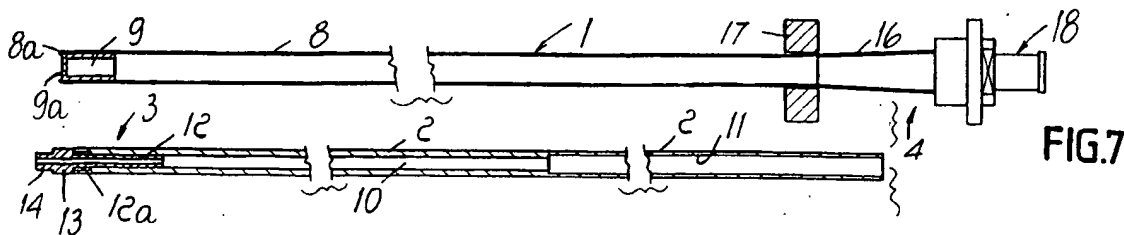
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**I-20123 Milan (IT)**(54) **Catheter particularly for gynecological treatments in bovine, equine or similar animals.**

(57) The catheter (1) includes a metallic cannula (2) insertable in a sheath (8) having two different internal diameters (10,11) for the insertion of two different types of tubes for frozen semen. An adapter is coupleable to the cannula (2) for securing the cannula (2) to the sheath (8) when the catheter (1) is used as a syringe. A grip terminal (4) is provided with a toroidal gasket for providing a seal on the cannula (2) ends and has, at one end, a frustum-

shaped configuration (16) for securing the ends of the sheath (8) and, at the other end, a coupling (18) for a syringe. A tube (5) for the introduction of frozen semen, which has a grip disk (23) at one end, has a diameter (24) substantially equal to the larger-diameter bore (11) of the cannula, and a terminal portion (25) having a diameter substantially equal to that of the smaller-diameter bore (10) of the cannula.

**FIG. 7****EP 0 538 786 A1****BEST AVAILABLE COPY**

The present invention relates to a catheter for introducing or aspirating various liquids in animals, particularly for gynecological treatments in bovine, equine or similar animals.

Syringes for artificial insemination and negative- or positive-pressure probes for withdrawing samples or for washing, introducing medical substances or the like, are known in this particular sector.

Whereas, as regards syringes, instruments are known which can be protected by a disposable covering sheath and therefore do not require sterilization of the armamentarium every time it is used, probes must instead be accurately sterilized prior to each operation on different animals.

The operator who must perform gynecological operations on animals in farms with a high livestock count and who does not know beforehand what kind of operation he will be called to perform is forced to bring with him both the insemination syringe and a certain number of sterilized probes for various operations on different animals; often it is assumed that it is necessary to operate by sterilizing said probes on-site between the operations.

The technical aim of the present invention is to obviate the above problems, i.e. to provide a single instrument which allows to perform both operations for insemination with fresh or frozen semen and operations for aspirating or introducing variously-acting substances into the animal.

Another object of the present invention is to provide an instrument which does not need to be sterilized for each operation.

Another object of the present invention is to avoid forcing the user to keep available a large number of instruments which have a considerable cost.

Another object of the present invention is to achieve the above aim with a simple structure which is relatively easy to manufacture, safe in use, effective in operation and relatively modest in cost.

This aim and these objects are achieved by the present catheter for introducing or aspirating various liquids in animals, particularly for gynecological treatments in bovine, equine or similar animals, characterized in that it comprises: a metallic cannula which can be inserted in a known disposable sheath for protecting artificial-insemination syringes and has, at its ends, two different internal diameters for the insertion of two different types of tubes for frozen semen; an adapter, which can be coupled to one end of said cannula, is provided with means for securing to the cannula, and is able to blend the cannula to the sheath when the catheter is used as a syringe; a grip terminal which can be applied on the two ends of the cannula, is provided with means for forming a seal on said

cannula and has, at one end, a frustum-shaped configuration for securing, by means of an external locking ring, the ends of said sheath and, at the other end, a coupling for a possible syringe, a fine tube for the introduction of frozen semen which has, at one end, a grip disk and has a diameter which is substantially equal to that of the larger-diameter hole of the cannula except for a terminal portion whose diameter is substantially equal to that of the smaller-diameter hole of said cannula.

Further peculiarities will become apparent and evident from the detailed description of a preferred but not exclusive embodiment of a catheter according to the present invention, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

figure 1 is a side view of a catheter during use as syringe for artificial insemination;

figure 2 is a side view of a catheter during use as catheter-probe for aspirating or introducing various substances in the animal;

figure 3 is an enlarged-scale view of the grip terminal;

figure 4 is an enlarged-scale view of the adapter;

figure 5 is a side view of a swab;

figure 6 is a side view of a sterilization and transport container;

figure 7 is a slightly enlarged diametrical sectional side view of some components of the catheter.

With particular reference to the above figures, the catheter according to the invention is generally designated by the reference numeral 1.

The catheter 1 comprises a cannula 2, an adapter 3, a terminal 4, a fine tube 5, a swab 6 and a sterilization and transport container 7 which are all advantageously made of metallic material.

The catheter according to the invention is suitable to operate with a known disposable sheath 8 used for artificial-insemination syringes; said sheath has, at one end, a rounded narrower portion 8a and is internally provided with a movable perforated cylinder 9 which has a narrower terminal hole 9a.

The cannula 2 externally has a diameter which is slightly smaller than the internal diameter of the sheath 8 and internally has, at one end 10, the diameter of 0.25-ml tubes for frozen semen and, at the other end, the diameter of 0.5-ml tubes for carrying frozen semen.

Inside the end 10 there is a short internally threaded portion 10a for the screw coupling of an externally threaded portion 12a of the adapter 12; the adapter has a portion 12 intended to be snugly inserted in the end 10 of the cannula; the adapter has an intermediate portion 13 which is approximately as large as the cannula and a narrower terminal portion 14 whose end is preferably

frustum-shaped and is suitable to sealingly rest in the hole of the cylinder 9 provided as accessory to the sheath 8: the adapter is fitted when the catheter is not being used for insemination using cannulas, and is screwed on the end 10 and is suitable to extend the cannula by the short extent which corresponds to the length of the frozen-semen tube, which protrudes from the cannula when the catheter is used for insemination, but even more to sealingly blend the cannula with the cylinder 9.

The terminal 4 can be sealingly inserted on the ends of the cannula and comprises a central grip part 15 which has, at one end, an elongated frustum-shaped configuration 16 for fixing the sheath by means of an external locking ring 17 made of a material such as plastics.

At the other end, the terminal 4 is monolithically provided with a coupling 18 for a possible syringe; said coupling is advantageously of the type commonly known as "Luer-Lock" and comprises an end 19 which is made of a square lip with rounded corners; the coupling 18 has a threaded terminal portion 20 for screw coupling in an axial threaded hole of the terminal 4; an annular seat is defined, between the end of the portion 20 and the end of the related threaded hole in the terminal, for a toroidal gasket 21 for providing a seal on the cannula; said gasket is of the type commercially known as O-ring; by unscrewing the coupling 18 it is possible to remove the ring 21 for cleaning or replacement; at the region where it rests against the central part 15, the coupling 18 has a front sealing flange 22 which is rigidly coupled thereto: said flange 22 can conveniently have flattened regions for grip with a tightening and loosening wrench.

The fine tube 5 has, at one end, a grip disk 23 and is slightly longer than the cannula 2; its diameter is, for most of its extent 24, substantially equal to the diameter of 11, whereas in its terminal portion 25 its diameter is substantially equal to the diameter 10.

The swab 6 is provided as accessory to the set and is constituted by a thin rod 26 provided, at one end, with radial bristles 27 and, at the other end, with a grip stud 28: a cylindrical container 7 is used for the sterilization of the components and their transport in sterile conditions; said container is closed at one end and is closeable, at the other end, by means of a plug 7a, advantageously of the screw-on type.

The catheter according to the invention can be used for artificial insemination by inserting the tube with the semen on one of its two ends and arranging the terminal 4 on the other end: the sheath is inserted and fixed on the terminal 4 by means of the plastic ring 17.

For use as syringe for artificial insemination, one uses the fine tube 5 which is inserted in the cannula on the end provided with the terminal 4. For use as catheter for introducing or aspirating substances into or from the animal, the adapter 3 is screwed at the end 10 of the cannula: the adapter presses against the perforated cylinder 9 of the sheath; simultaneously, the cylinder of a syringe is fixed on the coupling 19: by acting on the plunger of the cylinder it is possible to aspirate and push through the entire cannula: in this manner it is possible to perform both artificial insemination with fresh and refrigerated semen and operations for lavage, introducing medical substances, aspirating various fluids and the like.

A disposable sheath is fitted on the cannula also when it is used as probe-catheter.

In practice, the disposable sheath is inserted on the cannula at every operation performed on different animals, and therefore it is not necessary to perform sterilization prior to each successive operation.

It has thus been observed that the catheter according to the invention achieves the intended aim and objects.

The invention thus conceived is susceptible to numerous modifications and variations, all of which are within the scope of the inventive concept; thus, for example, length and diameter may vary according to the animals to be operated on.

All the details may furthermore be replaced with other technically equivalent ones.

In practice, the materials employed, as well as the shapes and dimensions, may be any according to the requirements without thereby abandoning the scope of the protection of the following claims.

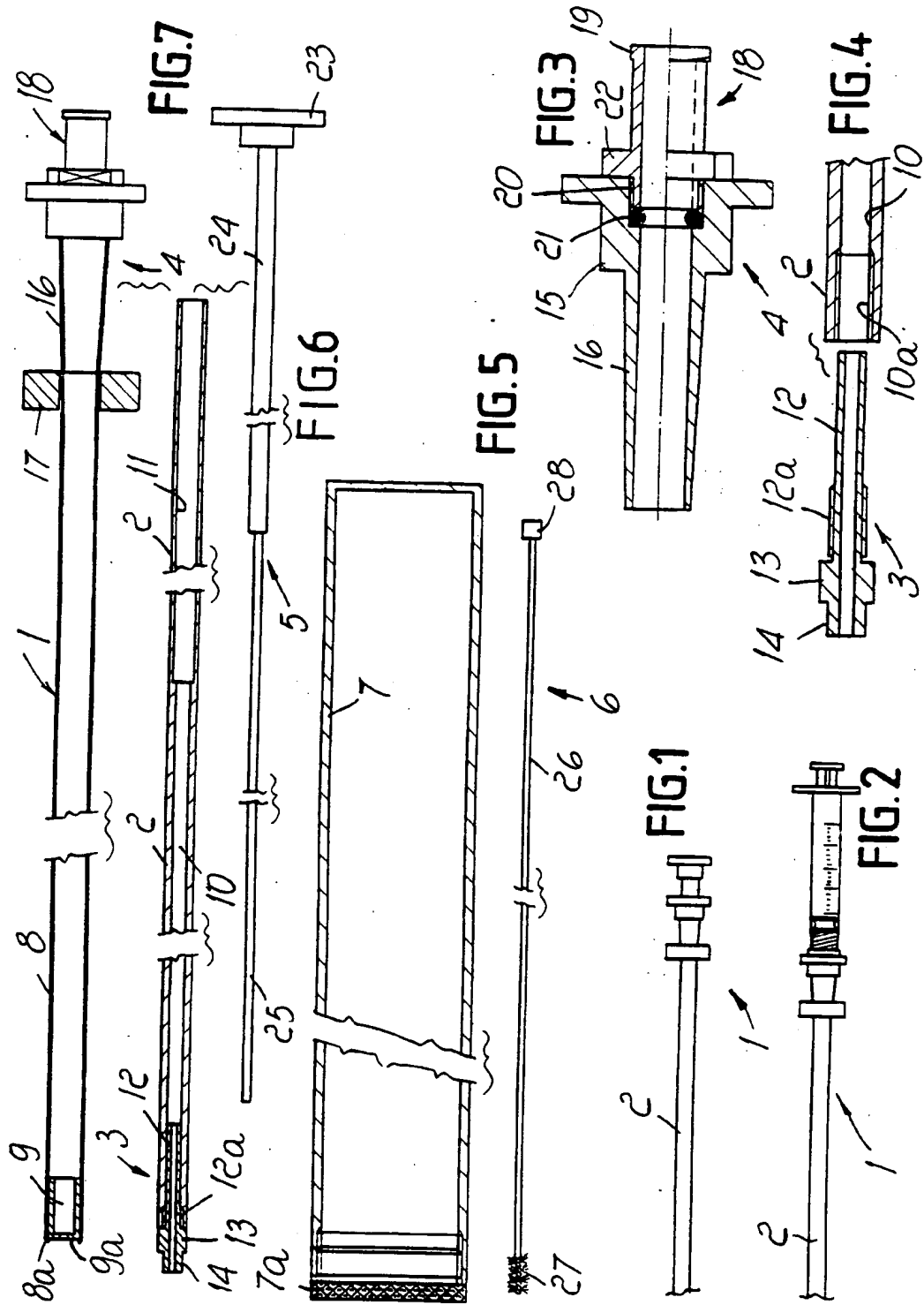
Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the scope of each element identified by way of example by such reference signs.

## Claims

1. Catheter (1) for introducing or aspirating various liquids in animals, particularly for gynecological treatments in bovine, equine or similar animals, characterized in that it comprises: a metallic cannula (2) insertable in a known disposable sheath (8) for protecting artificial-insemination syringes and comprising, at its ends, two different internal diameters (10,11) for the insertion of two different types of tubes for frozen semen; an adapter (3), coupleable to one end of said cannula (2), comprising means

for securing (12) to said cannula and able to blend said cannula (2) to the sheath (8) when said catheter (1) is used as a syringe; a grip terminal (4) applicable on the two ends of said cannula (2), comprising means for providing a seal (15) on said cannula and further comprising, at one end, a frustum-shaped configuration (16) for securing, by means of an external locking ring (17), the ends of said sheath (8) and, at the other end, a coupling (18) for a possible syringe; a fine tube (5) for the introduction of frozen semen comprising, at one end, a grip disk (23) and having a diameter (24) which is substantially equal to that of the larger-diameter hole (11) of said cannula except for a terminal portion (25) whose diameter is substantially equal to that of the smaller-diameter hole (10) of said cannula (2).

2. Catheter (1) according to claim 1, characterized in that said coupling (18) has an end (20) which can be screwed in an axial hole of said terminal (4), the end of said hole constituting a terminal wall of a seat for the accommodation of a sealing ring (21) of the type known as O-Ring.
3. Catheter (1) according to claim 1, characterized in that said syringe coupling (18) is of the type known as Luer-Lock.
4. Catheter (1) according to claim 1, characterized in that said means for securing (12) said adapter (3) comprise an external threaded portion (12a) of the adapter (3) which is screwed in internal threads (10a) of the cannula (2).
5. Catheter (1) according to claim 1, characterized in that a swab (6) for the internal cleaning of said cannula (2) and a tubular sterilization container (7) with a sealing plug (7a), for insertion of the various components, are provided as accessories of said cannula.





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## EUROPEAN SEARCH REPORT

Application Number

EP 92 11 7909

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	FR-A-2 358 136 (CASSOU) * the whole document *	1	A61D19/00
A	FR-A-2 395 010 (CASSOU) * page 2, line 26 - page 3, line 9; figure 1 *	1,2	
A	FR-A-1 467 943 (CASSOU) * the whole document *	1	
A	GB-A-2 070 437 (CASSOU) * abstract; figure 1 *	1	
A	FR-A-1 525 336 (CASSOU) * claim 1; figure 1 *	1	
A	FR-A-1 488 345 (CASSOU) * figure 9 *	1	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			A61D
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 03 FEBRUARY 1993	Examiner KOUSOURETAS I.
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ..... & : member of the same patent family, corresponding document	

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